3 CONTAMINATION PREVENTION AND DETECTION PROCEDURES

It is each member of the Forensic Biology Section's responsibility to consider the impact of his/her actions at each step of the evidence handling and analysis process to reduce the potential of introducing a foreign DNA source into the evidence or Data Bank samples. Therefore, everyone is encouraged to consider the impact of their actions beyond the practices addressed below.

3.1 Contamination Prevention Procedures

3.1.1 Cleaning/Decontamination Supplies

3.1.1.1 10% solution of bleach (7 mM sodium hypochlorite)

NOTE: In order for a 10% solution of bleach to be effective, the solution must be prepared daily.

3.1.1.2 Isopropyl Alcohol

3.1.2 General Contamination Prevention Practices

3.1.2.1 Remove disposable gloves after handling or analyzing evidence or Data Bank samples and before using the telephone, any computer key board, etc.

3.1.2.2 Disposable gloves, a laboratory coat, a face mask and head cover **WILL BE WORN** by any member of the Forensic Biology Section while inventorying and preserving the evidence or processing the evidence during the screening and DNA extraction steps. A laboratory coat and gloves will be worn during all other stages of the sample processing, including handling and labeling tubes. All visitors (individuals who do not have a DNA profile in CODIS) **WILL BE REQUIRED** to wear disposable gloves, a laboratory coat, a face mask, and head cover at all times while in the laboratory.

3.1.2.3 If it is necessary for someone to be in close proximity to a member of the Forensic Biology Section while he/she is inventorying and preserving evidence or processing evidence during the screening and DNA extraction steps, the individual **MUST WEAR** disposable gloves, a laboratory coat, a face mask, and head cover.

3.1.2.4 **DO NOT TOUCH** any surface which may contain a contaminant, such as the surface of the skin, eyes, safety glasses, clothing, or a non-cleaned bench-top, while wearing disposable gloves or working with evidence or Data Bank samples. Change gloves if such contact occurs.

3.1.2.5 Store all clean swabs, tubes, disposable pipettes, slides, etc. located in an area where evidence is examined/processed in closed containers.

3.1.2.6 Prior to, during, and/or after evidence preservation, screening, extraction, PCR setup, and post-amplification processes, wipe off examination/work areas (i.e., counter tops, drawer handles, biological safety cabinets, etc.), tools (i.e. tweezers, scissors, pipettes etc.), and tube racks with a 10% solution of bleach or a solution that will remove/degrade the DNA. Subsequently use Isopropyl Alcohol to remove the residue left by the chemicals, using special care to remove all residue left on surfaces.

3.1.2.7 Decontamination of the Pre- and Post-Amplification Rooms (May Be Conducted By Custodial Staff)

3.1.2.7.1 Daily decontamination practices for the pre- and post-amplification rooms may be modified based upon the laboratory setup and the availability of the custodial staff. To ensure all areas are decontaminated on a routine basis, it is recommended that a list of duties to be performed is posted in each area.

3.1.2.7.2 Refer to paragraph 3.1.2.6 for decontamination procedure and specific areas to be decontaminated. Also include the handles on the inside and outside of the doors leading into these areas. Use a disposable cleaning rag for decontaminating the post-amplification room and discard it in that room immediately following the decontamination.

3.1.2.7.3 Sweep and mop floors weekly in the post-amplification room with a designated broom and mop and bucket that remain in the room. Each post-amplification room should have its own broom, mop, and bucket.

3.1.2.8 Contamination Prevention Practices for Preservation, Screening, and Analysis of Each Case or Group of Cases

3.1.2.8.1 Work with only one item at a time to avoid sample mix-up and/or contamination.

3.1.2.8.2 Place each item of evidence on a new sheet of paper (i.e., Kimwipe, Kaydry, butcher, blotter, etc.). Change disposable gloves between each item of evidence.

3.1.2.8.3 ALWAYS handle all crime scene samples at a different **TIME** or in a different **SPACE** from standards/known samples.

3.1.2.8.4 Handle crime scene samples known to contain low levels of biological material before crime scene samples known to contain a higher concentration of biological material.

3.1.2.8.5 When preserving evidence, use different hoods or place barriers in one hood to separate crime scene samples known to contain low levels of biological material from those known to contain high levels of biological material and standards/known samples. Alternatively, crime scene samples can be preserved first, followed by decontamination of the drying area and subsequent preservation of the known samples.

3.1.2.8.6 Handle crime scene samples from a case or multiple cases first to prevent the potential of transferring DNA from the known samples into the crime scene samples. Handle standards/known samples ONLY after the crime scene samples have been put away and the work area and tools (e.g., scissors, tweezers, pipettes, etc.) have been cleaned. Alternatively, if two independent work areas are available the crime scene samples may be processed in one area and the standards/known samples in another area (i.e., at a different TIME and in a different SPACE).

3.1.2.8.7 Pulse spin all microcentrifuge sample tubes before they are opened to minimize aerosol and splashing.

Amplification sample tubes may be pulse spun or "wrist flicked" before they are opened.

3.1.2.8.8 During the extraction, PCR setup/amplification, and post-amplification processes, use a clean Kimwipe to open each microcentrifuge/amplification tube to minimize transferring DNA to the disposable gloves. If the evidence (i.e., stained area or the liquid from the cap of the tube) comes in contact with the disposable glove, change gloves before proceeding to the next stained area, item of evidence, or sample tube.

3.1.2.8.9 Clean/wash the typing gel plates in the post-amplification room. If a dish washer will be used to clean/wash the typing gel plates, the glass plates **MUST BE DECONTAMINATED** prior to removal from the post-amplification room using a reagent/detergent that will degrade the DNA.

3.1.2.8.10 Only the paperwork associated with amplification and gel typing will be carried into and out of the post-amplification room. This paperwork is not to be returned to an evidence examination or DNA extraction area of the laboratory after it has been in the post-amplification room.

3.1.2.8.11 Prior to exiting the post-amplification area remove gloves and laboratory coat, and wash hands in the designated sink.

3.1.2.9 The DNA Data Bank sample extraction, pre- and post-amplification, and scanning areas will be physically separated from the casework analysis areas. In addition, separate refrigerators/freezers from those used by the casework examiners will be used for storage of reagents and samples used by the Data Bank.

3.2 General Practices to Prevent Sample Switches

3.2.1 When a procedure requires the sample tube to be opened and the sample to be transferred from one tube to another (such as when preparing extracted DNA for amplification) and/or to perform a procedure (such as when loading samples into the typing gel), place the sample in a new sample tube

rack after completing the process to prevent the sample from accidentally being used a second time.

3.2.2 Any time a sample is transferred from one tube to another, verify the identifying information on the sample tube from which the sample is to be removed and the new pre-labeled tube into which the sample will be transferred **IMMEDIATELY PRIOR TO MAKING THE TRANSFER**.

3.2.3 Use a separate sample tube rack for the samples to be loaded into each typing gel to reduce the potential of loading samples intended for one gel into a different gel.

3.2.4 When possible, load the crime scene samples and the known standards for a case into the same typing gel to aid in the visual review of the gel images for possible sample switches or cross-contamination from one case to another.

3.2.5 Review all gel images, including all sample lanes, to identify possible sample switches or cross-contamination from one case to another.

3.3 General Practice to Prevent Cross-contamination

3.3.1 When possible, keep samples from different cases that are extracted at the same time together throughout the entire process.

♦END